

We claim:

1. A method for controlling engine operation in a vehicle, the engine coupled to an emission control device including at least platinum particles for converting emissions from the engine, the method comprising:

detecting a deceleration condition of the vehicle;

in response to said deceleration condition, adjusting fuel injection into the engine to maintain an exhaust mixture air-fuel ratio entering the emission control device to be lean, but less lean than a limit air-fuel ratio value, said limit air-fuel ratio value being a lean air-fuel ratio limit determined as a function of exhaust temperature.

2. The method recited in Claim 1 further comprising, adjusting an exhaust valve in an exhaust system of the engine to increase exhaust gas cooling.

3. The method recited in Claim 1 wherein said limit air-fuel ratio decreases as temperature increases, at least in one operating region.

4. The method recited in Claim 3 wherein said exhaust temperature includes temperature of the emission control device.

25 5. The method recited in Claim 4 wherein the exhaust includes a second emission control device coupled upstream of said emission control device.

30 6. The method recited in Claim 5 wherein said limit air-fuel ratio for said emission control device is based on an amount of oxygen storage of said upstream emission control device.

7. A method for controlling engine operation in a vehicle, the engine coupled to an emission control device including at least platinum particles for converting emissions from the engine, the method comprising:

5       detecting a deceleration condition of the vehicle;  
determining temperature of the emission control device;  
enabling fuel cut operation in at least one cylinder when  
said device temperature is less than a first value during said  
detected deceleration condition; and  
10      disabling fuel cut operation in at least one cylinder when  
said device temperature is greater than a second value.

8. The method recited in Claim 7 further comprising, in  
response to said deceleration condition, adjusting an exhaust  
15 valve in an exhaust system of the engine to increase exhaust gas  
cooling.

9. The method recited in Claim 8 wherein said fuel cut  
operation is enabled for all cylinders of the engine.

20       10. The method recited in Claim 7 wherein said detecting  
said deceleration condition includes detecting pedal position of  
a pedal actuated by a vehicle operator.

25       11. The method recited in Claim 7 wherein said first value  
is based on air-fuel ratio.

12. The method recited in Claim 7 wherein said first value  
is based on excess oxygen.

30       13. The method recited in Claim 7 wherein said second  
value is based on air-fuel ratio.

14. The method recited in Claim 7 wherein said second value is based on excess oxygen.

15. The method recited in Claim 7 wherein said first value  
5 equals said second value.

16. A method for controlling engine operation in a vehicle, the engine coupled to a first and second emission control device, the second emission control device including at least platinum particles for converting emissions from the engine, the method comprising:

detecting a deceleration condition of the vehicle;  
determining temperature of the emission control device;  
enabling fuel cut operation in at least one cylinder when  
15 said device temperature is less than a first value during said detected deceleration condition;  
disabling fuel cut operation in at least one cylinder when said device temperature is greater than a second value; and  
when said device temperature is between said first value  
20 and said second value, limiting a lean engine air-fuel ratio to a lean limit value determined based on said device temperature when an oxygen storage amount of said first emission control device has approached a storage capacity of said first emission control device, and enabling fuel cut operation or any lean air-fuel ratio when said oxygen storage amount of said first emission control device is below said storage capacity.

17. A method for controlling engine operation in a vehicle, the engine coupled to a first and second emission control device, the second emission control device including at least platinum particles for converting emissions from the  
5 engine, the method comprising:

detecting a deceleration condition of the vehicle;

determining temperature of the emission control device;

enabling fuel cut operation in at least one cylinder while said device temperature is less than a first value during said  
10 detected deceleration condition; and

enabling fuel cut operation for only a preselected period when said device temperature is greater than a second value.

18. The method recited in Claim 17 wherein said second  
15 value is equal to said first value.

19. The method recited in Claim 18 wherein said first value is based on exhaust air-fuel ratio entering or in said emission control device.  
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20. The method recited in Claim 17 wherein said preselected period include a time period.

21. The method recited in Claim 17 wherein said  
25 preselected period include a number of engine cycles.